

Lord of the Bing

Taking Back Search Engine Hacking From Google and Bing

30 July 2010



Presented by:

Francis Brown and Rob Ragan

Stach & Liu, LLC

www.stachliu.com

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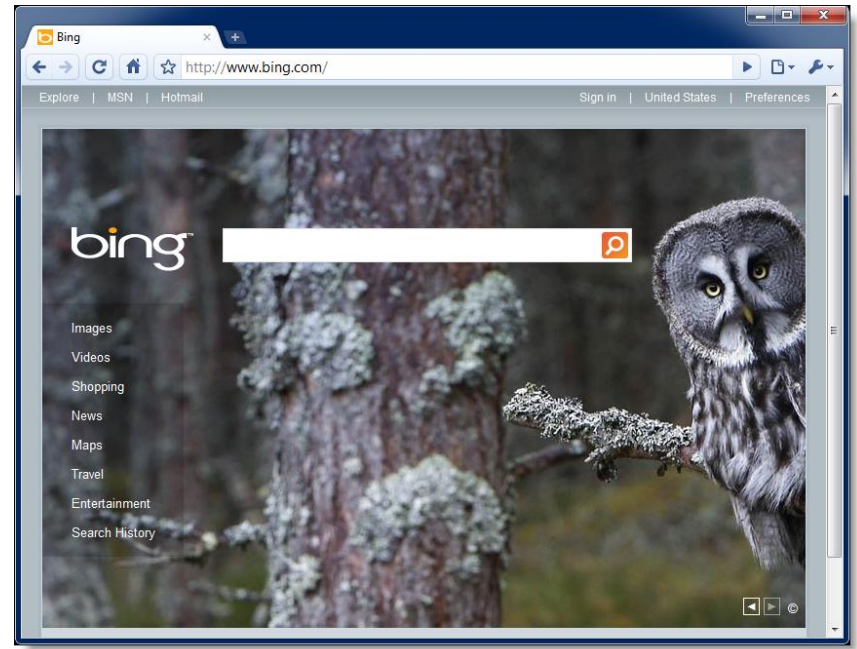
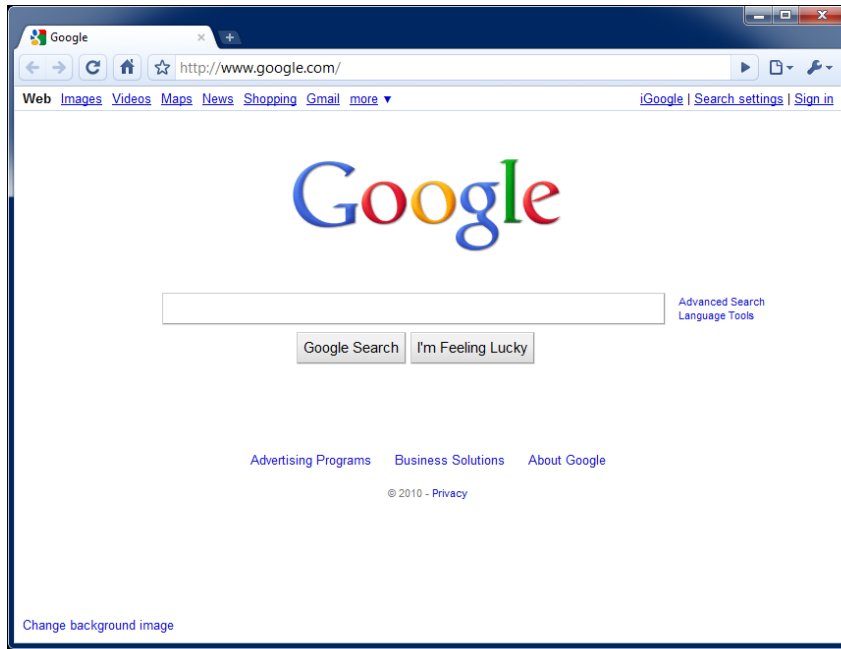
Goals

DROP KNOWLEDGE ON YOU

- *To improve* Google Hacking
 - Attacks and defenses
 - Advanced tools and techniques
- *To think differently* about exposures in publicly available sources
- To blow your mind!

Google/Bing Hacking

SEARCH ENGINE ATTACKS



Attack Targets

GOOGLE HACKING DATABASE

- Advisories and Vulnerabilities (215)
- Error Messages (58)
- Files containing juicy info (230)
- Files containing passwords (135)
- Files containing usernames (15)
- Footholds (21)
- Pages containing login portals (232)
- Pages containing network or vulnerability data (59)
- Sensitive Directories (61)
- Sensitive Online Shopping Info (9)
- Various Online Devices (201)
- Vulnerable Files (57)
- Vulnerable Servers (48)
- Web Server Detection (72)

Attack Targets

GOOGLE HACKING DATABASE

Old School Examples

- Error Messages
 - `filetype:asp + "[ODBC SQL"`
 - `"Warning: mysql_query()" "invalid query"`
- Files containing passwords
 - `inurl:passlist.txt`


New Toolkit

STACH & LIU TOOLS

Google Diggity

- Uses Google AJAX API
 - Not blocked by Google bot detection
 - Does not violate Terms of Service
-  • Can leverage **Google** custom search

Bing Diggity

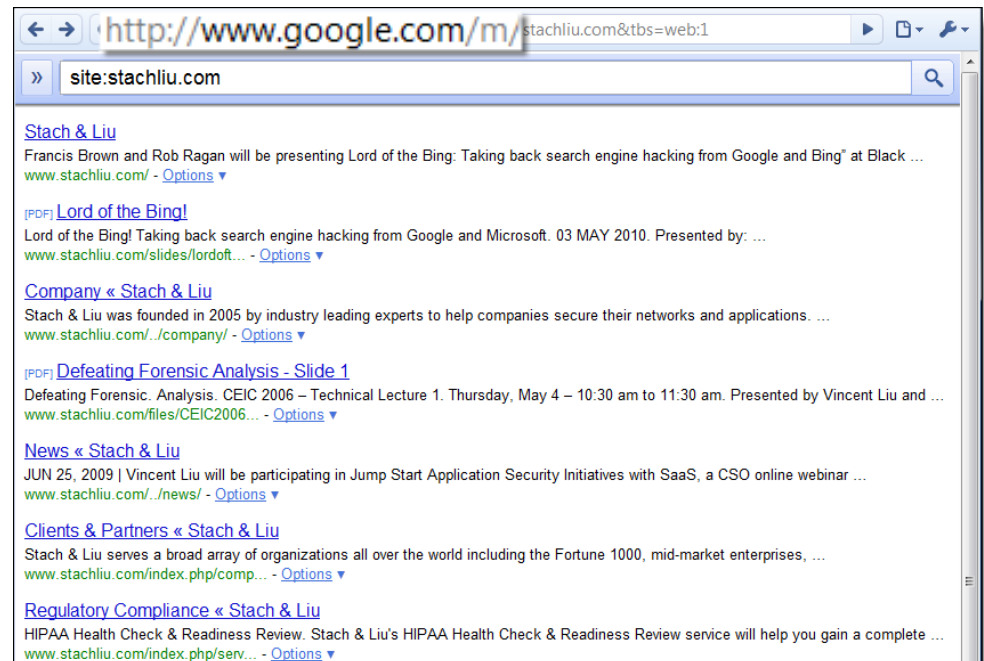
- Uses Bing 2.0 SOAP API
- Company/Webapp Profiling
 - Enumerate: URLs, IP-to-virtual hosts, etc.
-  • Bing Hacking Database (BHDB)
 - Vulnerability search queries in Bing format

New Toolkit

STACH & LIU TOOLS

GoogleScrape Diggity

- Uses Google mobile interface
 - Light-weight, no advertisements
 - *Violates* Terms of Service
- Bot detection avoidance
 - Distributed via proxies
 - Spoofs User-agent and Referer headers
 - Random `&userip=` value
 - Across Google servers



New Hack Databases

ATTACK QUERIES

BHDB – Bing Hacking Data Base

- First ever Bing hacking database
- Bing hacking limitations
 - Disabled **inurl:**, **link:** and **linkdomain:** directives in March 2007
 - No support for **ext:**, **allintitle:**, **allinurl:**
 - Limited **filetype:** functionality
 - Only 12 extensions supported

Example - Bing vulnerability search:

- GHDB query
 - "allintitle:Netscape FastTrack Server Home Page"
- BHDB version
 - `intitle:"Netscape FastTrack Server Home Page"`

The screenshot shows a Bing search results page. The search bar contains the query: `inanchor:pl inanchor:cgi intitle:'FormMail *''`. The search results are displayed in a table-like format with two columns. The left column lists related searches and search history, while the right column shows the main search results. The main results include links to 'FormMail.com :: HTML Form Processor', 'Matt's Script Archive: FormMail', 'Matt's Script Archive: FormMail Download', 'Bin Cgi Formmail.pl', 'FormMail v1.92', and 'FormMail v1'. Each result includes a brief description and a 'Cached page' link.

RELATED SEARCHES	ALL RESULTS
Free-form Mail Form Processor	FormMail.com :: HTML Form Processor Web Service to process and email the results of web forms. No programming or installation is needed. www.formmail.com · Cached page
PHP FormMail	Matt's Script Archive: FormMail Overview: FormMail is a generic HTML form to e-mail gateway that parses the results of any form and sends them to the specified users. This script has many formatting and ... www.scriptarchive.com/formmail.html · Cached page
ASP FormMail	Matt's Script Archive: FormMail Download Optional Information: Supplying your e-mail address is completely optional. You can also request to be subscribed to the new-scripts mailing list, which receives occasional messages ... www.scriptarchive.com/download.cgi?s=formmail · Cached page
Cgi FormMail	Bin Cgi Formmail.pl Bin Cgi Formmail.pl FOUND IT HERE! calor de de formas transmission care child form home mathematical transformation enter key submit form 1 crash formula grou.ps/bincgiformmail.pl · Cached page
NMS FormMail	FormMail v1.92 Copyright 1995 - 2002 Matt Wright Version 1.92 - Released April 21, 2002 A Free Product of Matt's Script Archive, Inc. formmail.monstercommerce.com/cgi-bin/ntformmail/ntformmail.pl · Cached page
Matt's FormMail	FormMail v1 FormMail home.xtra.co.nz/cgi-bin/FormMail.pl · Cached page
FormMail Not Working	

New Hack Databases

ATTACK QUERIES

SLDB - Stach & Liu Data Base

- New Google/Bing hacking searches in active development by the S&L team

SLDB Examples

- `ext:(doc | pdf | xls | txt | ps | rtf | odt | sxw | psw | ppt | pps | xml) (intext:confidential salary | intext:"budget approved") inurl:confidential`
- `filetype:sql "insert into" (pass|passwd|password)`
- `!Host=*. * intext:enc_UserPassword=* ext:pcf`
- `"your password is" filetype:log`

NEW GOOGLE HACKING TOOLS

DEMO

Traditional Defenses

GOOGLE HACKING DEFENSES

- “Google Hack yourself” organization
 - Employ tools and techniques used by hackers
 - Remove info leaks from Google cache
 - Using Google Webmaster Tools
- Regularly update your robots.txt.
 - Or robots meta tags for individual page exclusion
- Data Loss Prevention/Extrusion Prevention Systems
 - Free Tools: OpenDLP, Senf
- Policy and Legal Restrictions

Traditional Defenses

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 - Free Tools: OpenDLP, Senf
- Policy and Legal Restrictions



Advanced Defenses

PROTECT YO NECK

Existing Defenses

"HACK YOURSELF"

- ✓ Tools exist
- ✗ Convenient
- ✗ Real-time updates
- ✗ Multi-engine results
- ✗ Historical archived data
- ✗ Multi-domain searching

Advanced Defenses

NEW HOT SIZZLE

Stach & Liu now proudly presents:

- Google Hacking Alerts
- Bing Hacking Alerts

Google Hacking Alerts

ADVANCED DEFENSES

Google Hacking Alerts

- All hacking database queries using **Google alerts**
- Real-time vuln updates to >2400 hack queries via RSS
- Organized and available via **Google reader** importable file

stachliu0@gmail.com | [Settings](#) | [FAQ](#) | [Sign out](#)

Google alerts Manage your Alerts

GHDB regexes made into Google Alerts

Your Google Alerts [Switch to text emails](#) | [Export alerts](#)

Search terms	Type	How often	Email length	Deliver to
<input type="checkbox"/> !Host=*.*.intext:enc_UserPassword=* ext:pcf	Web	as-it-happens	up to 50 results	Feed View in Google Reader edit
<input type="checkbox"/> "# Dumping data for table (username user users password)"	Web	as-it-happens	up to 50 results	Feed View in Google Reader edit
<input type="checkbox"/> "# Dumping data for table"	Web	as-it-happens	up to 50 results	Feed View in Google Reader edit
<input type="checkbox"/> "# phpMyAdmin MySQL-Dump" "INSERT INTO" -"the"	Web	as-it-happens	up to 50 results	Feed View in Google Reader edit

RSS Feeds generated that track new GHDB vulnerable pages in real-time

Google Hacking Alerts

ADVANCED DEFENSES

Google reader

All items (1000+)

People you follow

Explore

Subscriptions

- FSDB-Backup Files (195)
- FSDB-Configuration Ma... (371)
- FSDB-Error Messages (654)
- FSDB-Privacy Related (501)
- FSDB-Remote Administr... (102)
- FSDB-Reported Vulnera... (90)
- FSDB-Technology Profile (652)
- GHDB-Advisories and V... (1000+)
- GHDB-Error Messages (1000+)
- Google Alerts - "mysql..." (11)**
- Google Alerts - "A sv..." (10)
- Google Alerts - "acce..." (45)
- Google Alerts - "An i..." (1)
- Google Alerts - "ASP..." (5)

Google Alerts - "mysql error with query"

Show: 11 new items - all items

Mark all as read

Refresh

Feed settings...

James Bond 007 :: MI6 - The Home Of James Bond

via [Google Alerts - "mysql error with query"](#)

mysql error with query SELECT c.citem as itemid, c.cnumber as commentid, c.cbody as body, c.cuser as user, c.cmail as userid, c.cemail as email, ...
www.mi6.co.uk/mi6.php3/news/index.php?itemid...

Add star Like Share Share with note Email Add tags

Several thousand GHDB/FSDDB vuln alerts generated each day

James Bond needs help!
mysql error page snippet conveniently provided in RSS summary

Bing Hacking Alerts

ADVANCED DEFENSES

Bing Hacking Alerts

- Bing searches with regexs from BHDB
- Leverage `&format=rss` directive to turn into update feeds
- Real-time vuln updates to >900 Bing hack queries via RSS

The screenshot shows a Google Reader interface with a subscription list on the left and a feed of items on the right. The subscription list includes categories like 'BHDB-Advisories and V...', 'BHDB-Backup Files', 'BHDB-Configuration Ma...', 'BHDB-Error Messages', 'BHDB-Files containing...', 'BHDB-Files containing...', 'BHDB-Files containing...', 'BHDB-Footholds', 'BHDB-Misc', 'BHDB-Pages containing...', 'BHDB-Privacy Related', 'BHDB-Remote Administr...', 'BHDB-Reported Vulnera...', and 'BHDB-Sensitive Direct...'. The main feed is titled 'Bing: intitle:Snap Server intitle:Home Active Users' and shows a list of items with titles like 'Snap Server WELW-SNAP [Home]', 'Snap Server CORESERVER [Home]', 'Snap Server GSTI [Home]', 'adsphotographer.com - SNAP55373', 'Snap Server SNAP824929 [Home]', 'Snap Server SAINTSNAP [Home]', 'Snap Server DIGITALDATA1 [Home]', 'Snap Server FTP-SERVER [Home]', 'Snap Server XRAY7 [Home]', and 'Snap Server SNAP205861 [Home]'. The 'Snap Server FTP-SERVER [Home]' item is expanded, showing details: 'Flinn - Flinn OFF-Site Backup: Home - Folder for network shares/drive mapping: MyHost - Folder for my personal Web Hosting: msmcs.net - www.msmcs.net PUB FTP'. Below the details are options to 'Add star', 'Like', 'Share', 'Share with note', 'Email', 'Keep unread', and 'Edit tags: BHDB-Variou Online Devices'.

Bing/Google Alerts

THICK CLIENTS TOOLS

Google/Bing Hacking Alert Thick Clients

- Google/Bing Alerts *RSS feeds as input*
- Allow user to *set one or more filters*
 - e.g. “*yourcompany.com*” in the URL
- Several *thick clients* being released:
 - Google Desktop Gadget
 - OS independent client
 - Droid app (coming soon)

ADVANCED DEFENSE TOOLS

DEMO

New Defenses

"GOOGLE/BING HACK ALERTS"

- ✓ Tools exist
- ✓ Convenient
- ✓ Real-time updates
- ✓ Multi-engine results
- ✓ Historical archived data
- ✓ Multi-domain searching

Google Apps Explosion

SO MANY APPLICATIONS TO ABUSE

Google alerts

Google reader

Google™
PhoneBook

Google custom search

Google™
trends

Google buzz 

Google™
code search labs 

Google code

Google health

Google calendar

Google news

Google™ public data explorer
labs 

Google docs

Google Insights for Search
beta

Google™ wave 
preview

Google blogs

Google maps

Google groups

Google PhoneBook



SPEAR PHISHING

Google PhoneBook search interface showing results for "phonebook: schmidt, eric". The search bar contains "phonebook: schmidt, eric" and buttons for "Search PhoneBook", "Search the Web", and "Preferences".

Residential Phonebook Results 121 - 150 of about 209 for phonebook: schmidt, e

Eric Schmidt	(952) 403-9689	1761 Countryside Dr, Shakopee, MN 55379-4451	Map
Eric Schmidt	(815) 522-6299	413 Prairie St, Kirkland, IL 60146-0000	Map
Eric Schmidt	(636) 942-3494	6404 Lipizzaner Dr, Imperial, MO 63052-4142	Map
Eric Schmidt	(618) 644-9277	2260 Steinkoenig School R, Highland, IL 62249-4006	Map
Eric Schmidt	(715) 324-5232	N17082 Roth Ln, Pembine, WI 54156-0000	Map
Eric Schmidt	(360) 854-0973	24400 Mckendree Ln, Sedro Woolley, WA 98284-7814	Map
Eric Schmidt	(650) 964-4017	Mountain View, CA 94043-0000	Map
Eric Schmidt	(207) 848-2221	41 Hardwood Dr, Hermon, ME U4401-U253	Map

A red speech bubble points to the entry for Mountain View, CA, with the text "Google CEO - Eric Schmidt".

Google Code Search



VULNS IN OPEN SOURCE CODE

- Regex search for vulnerabilities in public code
- Example: SQL Injection in ASP querystring
 - `select.*from.*request\.QUERYSTRING`

The screenshot shows a Google Code Search interface. The search bar contains the query `select.*from.*request\.QUERYSTRING`. The search results show a file named `post.asp` with the following code snippet:

```
45: strSql ="SELECT * from reply where reply_id = " & Request.QueryString("reply_id")
46: msg = "<br><br>×çðâ±°ö»óð,ÃîÃðÃ×-ðß°í²ùÀíô±²ÅÄÜ±²±öâ,øìú×ó."
57: strSql ="SELECT T Message from Topics where Topic_id = " & Request.QueryString("reply_id")
58: msg = "<br><br>×çðâ±°ö»óð,ÃîÃðÃ×-ðß°í²ùÀíô±²ÅÄÜ±²±öâ,øìú×ó."
```

A red callout box points to the `reply_id` parameter in the SQL query, stating: `reply_id` is SQL injectable querystring parameter. The search results also indicate that there are about 2,000 results for this query.

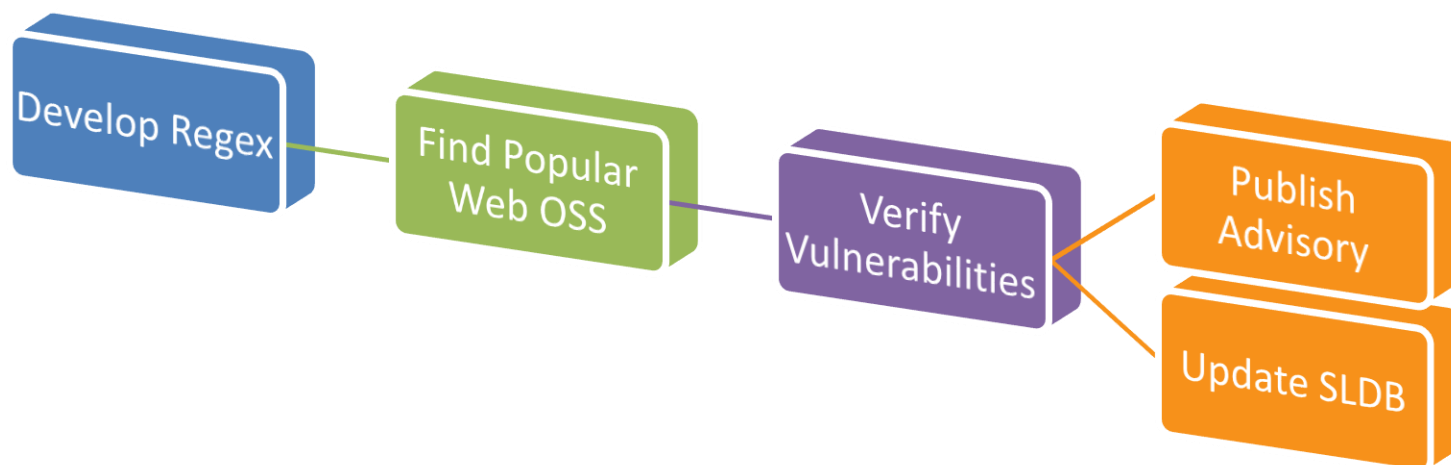
GOOGLE CODE SEARCH HACKING

DEMO

Google Code Search



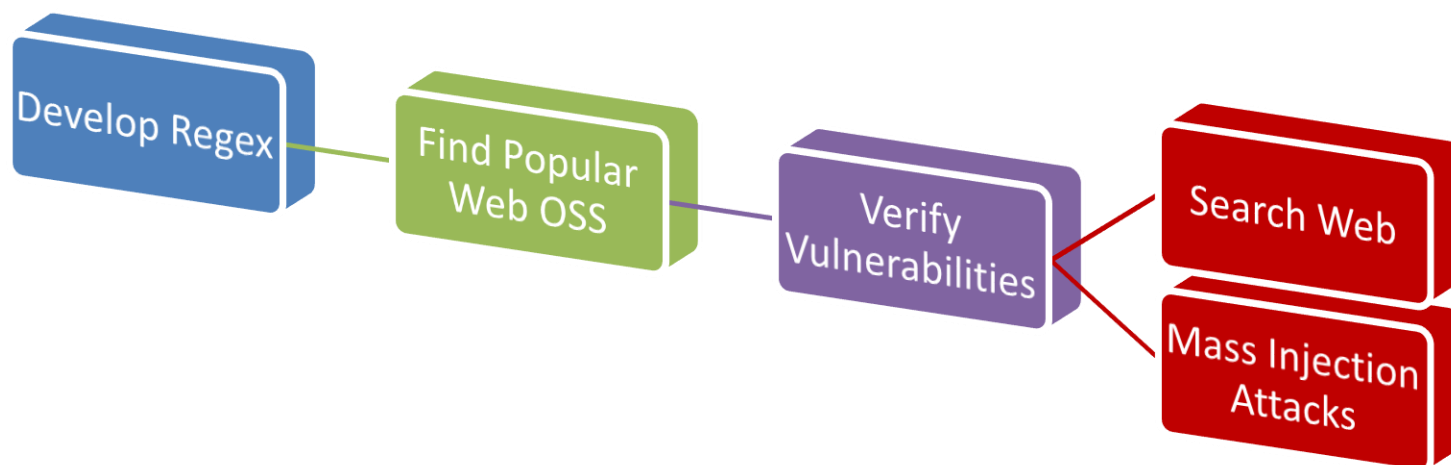
VULNS IN OPEN SOURCE CODE



Google Code Search



VULNS IN OPEN SOURCE CODE



Black Hat SEO

SEARCH ENGINE OPTIMIZATION

- Use popular search topics du jour
- Pollute results with links to badware
- Increase chances of a successful attack



Google Trends



BLACK HAT SEO RECON

The screenshot shows the Google Insights for Search interface. The 'Compare by' section has 'Search terms' selected. The 'Search terms' input field contains 'All search terms'. The 'Filter' section is set to 'Web Search', 'United States', 'All subregions', 'All metros', '2004 - present', and 'All Categories'. A red callout box points to the '2004 - present' filter with the text 'Top Google searches over past 6 years'. Below the filters, the 'Web Search Interest' section shows 'United States, 2004 - present'. The 'Search terms' table lists 'lyrics' as the top search, circled in red. A red callout box points to this entry with the text 'Fake lyrics web sites setup to appear in Google search results, infect you with malware upon clicking'. To the right, a news article snippet is visible with the headline 'Lada Gaga, Rihanna lyrics sites used to foist Java exploit'.

Google Insights for Search beta

Help | Sign in | Download as CSV | English (US)

Compare by

- Search terms
- Locations
- Time Ranges

Search terms

Tip: Use a comma as shorthand to add comparison items. (tennis, squash)

All search terms

Filter

Web Search

United States | All subregions | All metros

2004 - present

All Categories

Search

Web Search Interest

United States, 2004 - present

Search terms

Top searches

- lyrics
- you
- yahoo

Lada Gaga, Rihanna lyrics sites used to foist Java exploit

Dan Kaplan April 14, 2010

PRINT | EMAIL | REPRINT | PERMISSIONS | FONT SIZE: A | A | A

As expected, virus writers now are actively exploiting a zero-day Sun

RELATED ARTICLES

Defenses

BLACKHAT SEO DEFENSES

- Malware Warning Filters
 - Google Safe Browsing
 - Microsoft SmartScreen Filter
 - Yahoo Search Scan
- Sandbox Software
 - Sandboxie (sandboxie.com)
 - Dell KACE - Secure Browser
 - Office 2010 (Protected Mode)
 - Adobe Reader Sandbox (Protected Mode)
- No-script and Ad-block browser plugins

Mass Injection Attacks

MALWARE GONE WILD

Malware Distribution Woes

- Popular websites victimized, become malware distribution sites to their own customers

Massive Malware Hits Media Web Sites

Security researchers estimate that roughly 7,000 Web pages were compromised in a SQL injection attack this week, including *The Wall Street Journal* and *Jerusalem Post*.

By Mathew J. Schwartz, [InformationWeek](#)

June 10, 2010

URL: <http://www.informationweek.com/story/showArticle.jhtml?articleID=225600247>

"Every time I load Jpost site, I get nas on Tuesday, referring to the Jerusalem

Sure enough, the Web sites of the *Jerusalem Post* and the Association of Christian Scholars sites serving malware to viewers.

From: www.itworld.com

Mass Web attack hits Wall Street Journal, Jerusalem Post

by Robert McMillan

June 9, 2010 —Internet users have been hit by a widespread Web attack that has compromised thousands of Web sites, including Web pages belonging to the Wall Street Journal and the Jerusalem Post.

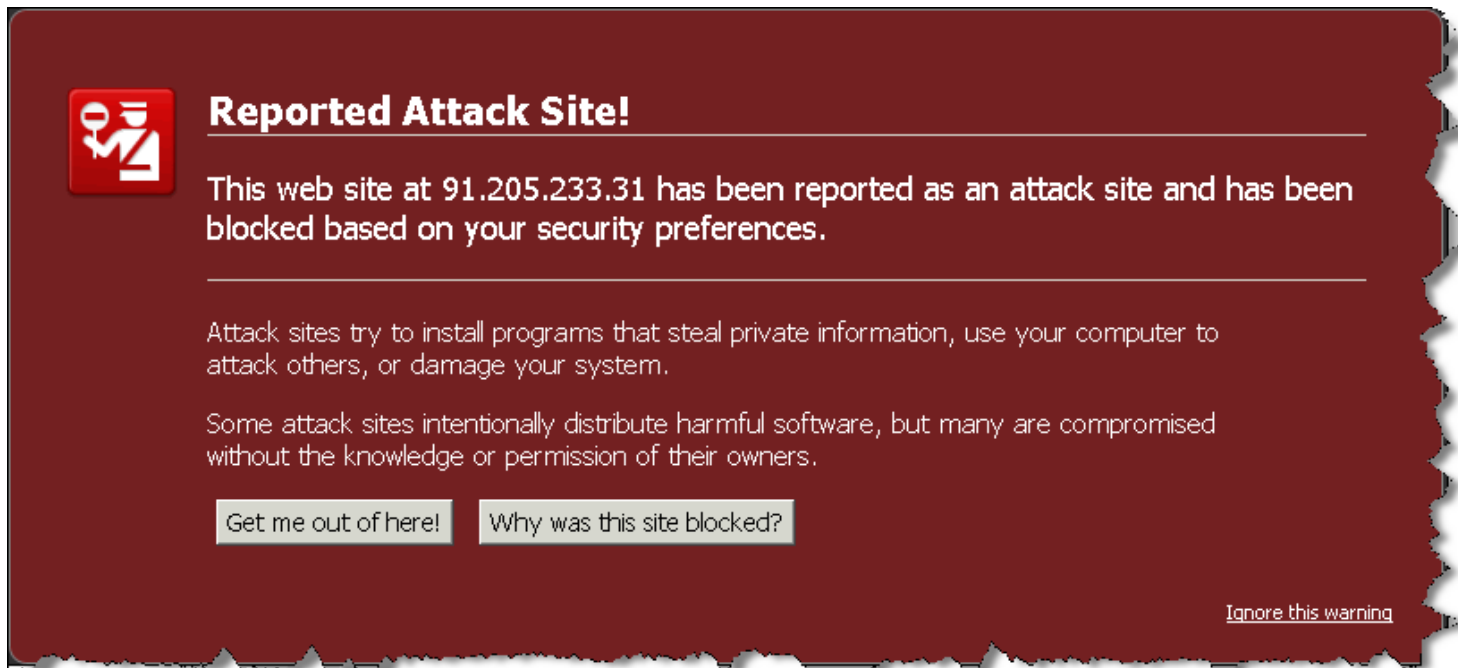
Estimates of the total number of compromised Web sites vary between 7,000 and 114,000, according to security experts. Other compromised sites include servicewomen.org and intijobs.org.


Malware Browser Filters

URL BLACK LIST

Protecting users from known threats

- Joint effort to protect customers from known malware and phishing links



 **Reported Attack Site!**

This web site at 91.205.233.31 has been reported as an attack site and has been blocked based on your security preferences.

Attack sites try to install programs that steal private information, use your computer to attack others, or damage your system.

Some attack sites intentionally distribute harmful software, but many are compromised without the knowledge or permission of their owners.

[Get me out of here!](#) [Why was this site blocked?](#)

[Ignore this warning](#)

Inconvenient Truth

DICKHEAD ALERTS

Malware Black List Woes

- Average web administrator has no idea when their site gets black listed



Advanced Defenses

PROTECT YO NECK

Malware Diggity

ADVANCED DEFENSES

Malware Diggity

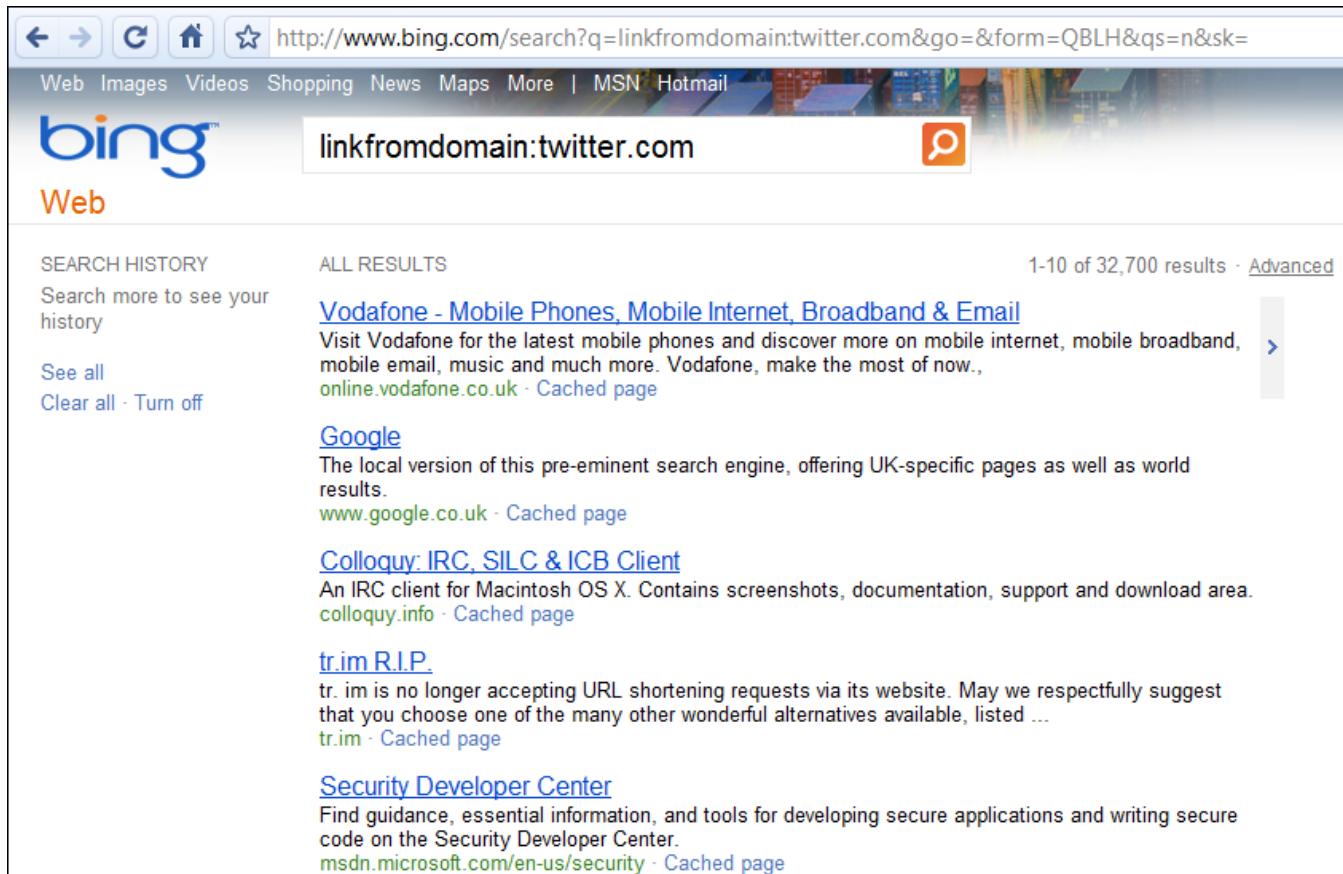
- Uses Bing's **linkfromdomain:** directive to *identify off-site links* of the domain(s) you wish to monitor
- Compares to *known malware sites/domains*
 - Alerts if site is compromised and now distributing malware

Malware Diggity Alerts

- Leverages the Bing **'&format=rss'** directive, to *actively monitor new off-site links* of your site as they appear
- Immediately lets you know if you have been compromised by one of these mass injection attacks or if your site has been black listed

Malware Diggity

ADVANCED DEFENSES



The screenshot shows a Bing search results page. The address bar contains the URL: <http://www.bing.com/search?q=linkfromdomain:twitter.com&go=&form=QBLH&qsn&sk=>. The search bar contains the query: `linkfromdomain:twitter.com`. The page displays search results for the query, including:

- Vodafone - Mobile Phones, Mobile Internet, Broadband & Email**
Visit Vodafone for the latest mobile phones and discover more on mobile internet, mobile broadband, mobile email, music and much more. Vodafone, make the most of now.,
online.vodafone.co.uk - Cached page
- Google**
The local version of this pre-eminent search engine, offering UK-specific pages as well as world results.
www.google.co.uk - Cached page
- Colloquy: IRC, SILC & ICB Client**
An IRC client for Macintosh OS X. Contains screenshots, documentation, support and download area.
colloquy.info - Cached page
- tr.im R.I.P.**
tr.im is no longer accepting URL shortening requests via its website. May we respectfully suggest that you choose one of the many other wonderful alternatives available, listed ...
tr.im - Cached page
- Security Developer Center**
Find guidance, essential information, and tools for developing secure applications and writing secure code on the Security Developer Center.
msdn.microsoft.com/en-us/security - Cached page

SEARCH HISTORY: Search more to see your history. See all. Clear all · Turn off.

ALL RESULTS: 1-10 of 32,700 results · [Advanced](#)

Malware Diggity

ADVANCED DEFENSES

YAHOO!

SITE EXPLORER

Site Explorer

- Add to MySites
- My Sites
- Submit Your Site
- Preferences
- Blog
- Badge
- Web Service API
- Feedback

Results

Pages (70) **Inlinks (4,130)** Show Inlinks: to:

Result details:

[Submit webpage or Site Feed](#) | [Export first 1000 results to TSV](#)

1.	Unofficial MD5 text/html http://userpages.umbc.edu/~mabzug1/cs/md5/md5.html - 12k - cache	<input type="button" value="Explore"/>
2.	Offensive Computing Community Malicious code research and ... text/html http://www.offensivecomputing.net/ - 35k - cache	<input type="button" value="Explore"/>
3.	Approved Scanning Vendors text/html https://www.pcisecuritystandards.org/pdfs/asv_report.html - 34k - cache	<input type="button" value="Explore"/>
4.	Peter Selinger: MD5 Collision Demo text/html http://www.mscs.dal.ca/~selinger/md5collision/ - 13k - cache	<input type="button" value="Explore"/>
5.	Microsoft BlueHat Blog - Site Home - TechNet Blogs text/html http://blogs.technet.com/b/bluehat/ - 140k - cache	<input type="button" value="Explore"/>
6.	Checkmarx Source Code Analysis Technologies text/html http://www.checkmarx.com/ - 48k - cache	<input type="button" value="Explore"/>
7.	Black Hat USA Spotlight: ATL Killbit Bypass - Microsoft ... text/html http://blogs.technet.com/b/bluehat/archive/2009/07/27/black-hat-usa-atl-killbit-bypass.aspx - 151k - cache	<input type="button" value="Explore"/>

armorize HackAlert™

Secure Your Web Applications

SCAII DETAILS

Selected Monitor: zcrack	Clean URLs: 0
Status: Analyzing	URLs with suspicious links: 0
Duration: 41 Seconds	URLs with malware: 2
Total URLs Crawled: 3	

66%

Crawler Output

All URLs Clean URLs Suspicious Links Malware

```

2010-05-12 10:47:37 Analyzing crawled URLs...
2010-05-12 10:47:34 WARNING: MALWARE DETECTED! 1 URLS AFFECTED - Click the 'Malware' tab for details.
2010-05-12 10:47:34 Analyzing crawled URLs...
2010-05-12 10:47:32 WARNING: MALWARE DETECTED! 1 URLS AFFECTED - Click the 'Malware' tab for details.
2010-05-12 10:47:32 Analyzing crawled URLs...
2010-05-12 10:47:29 Analyzing crawled URLs...
2010-05-12 10:47:27 Analyzing crawled URLs...
2010-05-12 10:47:24 Analyzing crawled URLs...
2010-05-12 10:47:22 Analyzing crawled URLs...
2010-05-12 10:47:19 Analyzing crawled URLs...
2010-05-12 10:47:17 Analyzing crawled URLs...
2010-05-12 10:47:15 Analyzing crawled URLs...
2010-05-12 10:47:12 Analyzing crawled URLs...
2010-05-12 10:47:10 Analyzing crawled URLs...
2010-05-12 10:47:07 Analyzing crawled URLs...
2010-05-12 10:47:05 Analyzing crawled URLs...
2010-05-12 10:47:04 Analyzing crawled URLs...
                
```

You can copy and paste the crawler output.

REPORT DETAILS

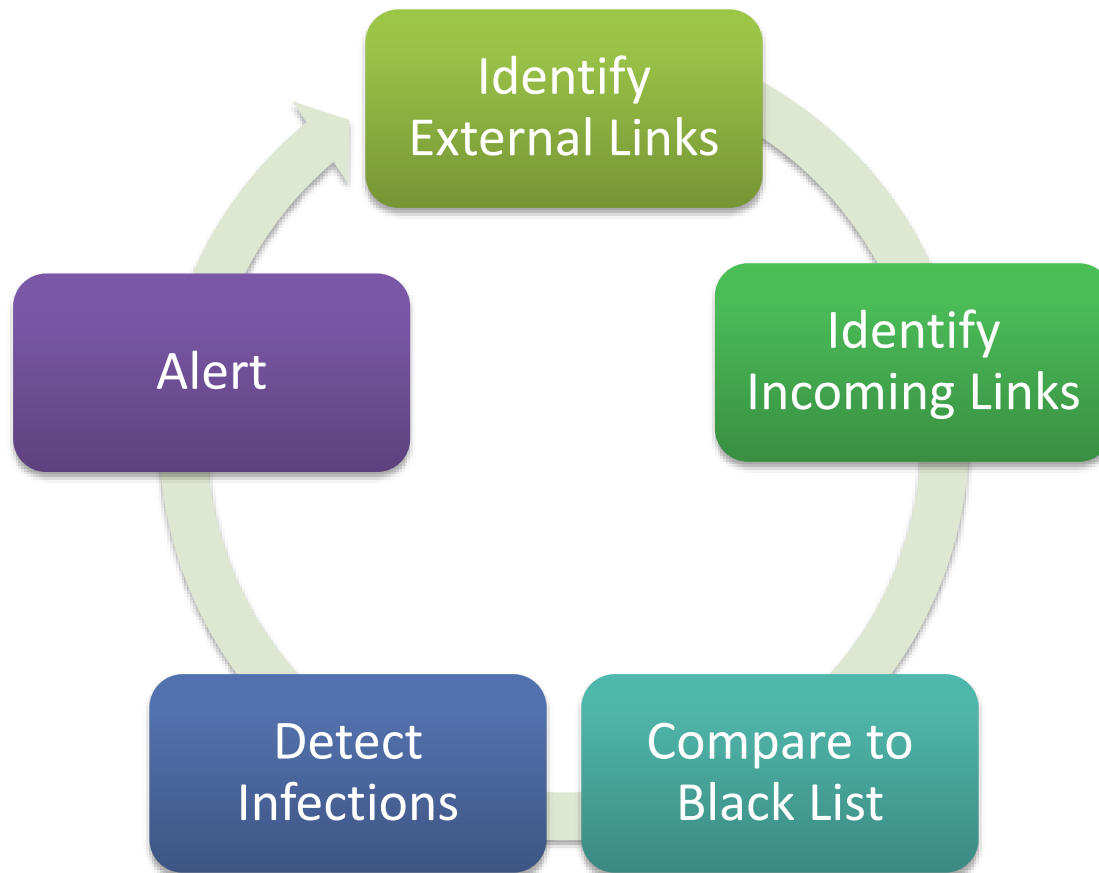
Selected Monitor: zcrack	Clean URLs: 0
Status: Finished	URLs with suspicious links: 0
Crawl Time: May 12th, 2010 - 10:43	URLs with malware: 3
Duration: 46 Seconds	URLs blacklisted: 0
Total URLs Crawled: 3	

All URLs Clean URLs Suspicious URLs Malware Blacklisted URLs

Status	URL
M	http://www.zcrack.org/ <div style="background-color: #fff9c4; padding: 5px; margin-top: 5px;"> <p>Trigger the following Malicious Behaviours: DRIVE_BY_DOWNLOAD</p> <p>Contains hidden iframes, frames or scripts which links to the following URLs: http://malwareguru.com/malware/MS06-014/MS06-014.htm http://malwareguru.com/malware/MS06-014/MS06-014.js http://malwareguru.com/malware/MS06-042/MS06-042.html</p> <p>Trigger DRIVE_BY_DOWNLOADS that originate here: http://malwareguru.com/common_exe/test.avi</p> <p>Remediation Information: Remove the following lines from your code or database. Line: 211 - <iframe src="http://malwareguru.com/malware/MS06-042/MS06-042.html" width="0" height="0"></iframe> Line: 215 - <script src="http://malwareguru.com/malware/MS06-014/MS06-014.js"></script> Line: 217 - <iframe src="http://malwareguru.com/malware/MS06-014/MS06-014.htm" width="0" height="0"></iframe></p> </div>

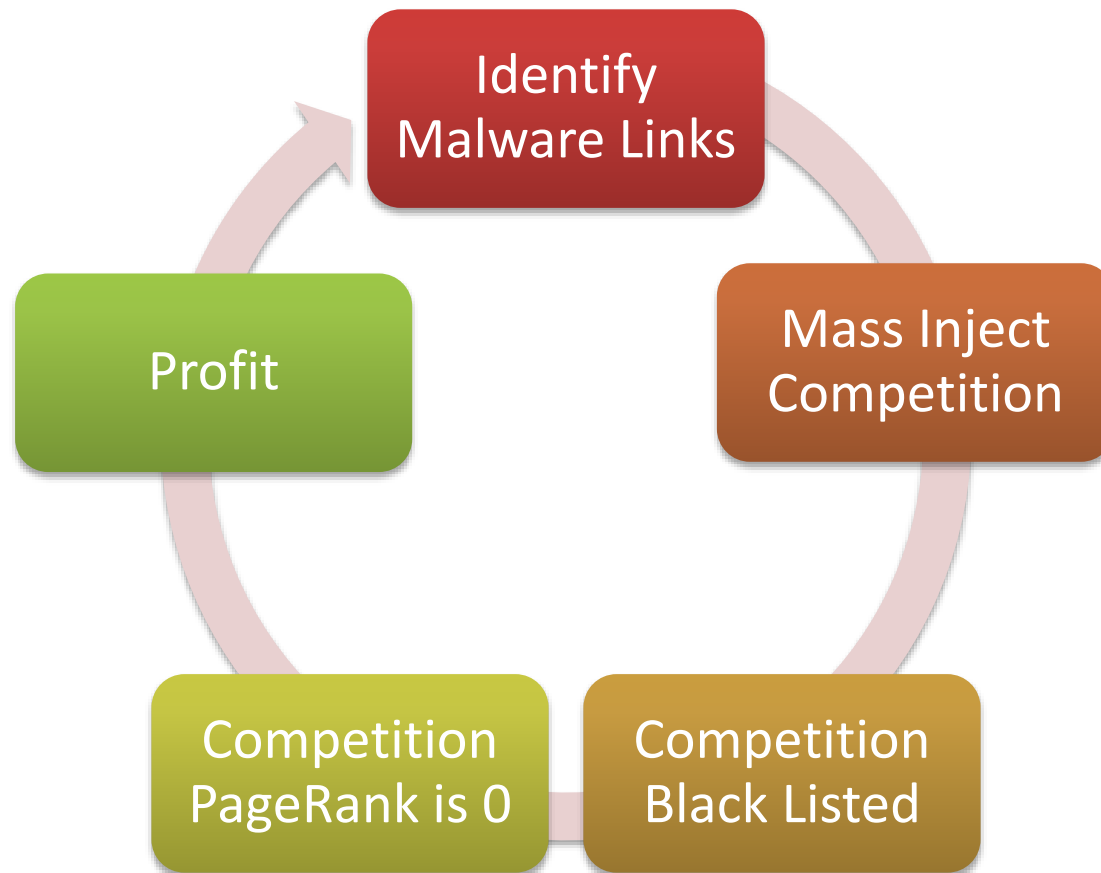
Malware Monitoring

INFECTION DETECTION



Search Engine deOptimization

BLACK LIST YOUR FOES



Future Direction

PREDICTIONS

Predictions

FUTURE DIRECTIONS

Data Explosion

- More data indexed, searchable
- Real-time, streaming updates
- Faster, more robust search interfaces

Google Involvement

- Filtering of search results
- Better GH detection and tool blocking

Renewed Tool Dev

- Google Ajax API based
- Bing/Yahoo/other engines
 - Search engine aggregators
- Google Code and Other Open Source Repositories
 - MS CodePlex, SourceForge, ...
- More automation in tools
 - Real-time detection and exploitation
 - Google worms

Real-time Updates

FUTURE DIRECTIONS

Google obama Search [Advanced Search](#)

Web > Updates [Hide options](#) Results 1 - 10 of about 4 for obama. (0.58 seconds)

[All results](#)
[Images](#)
[Videos](#)
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